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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,670	03/23/2001	Hiroshi Yoshida	09792909-4825	5768
26263	7590	02/25/2004	EXAMINER	
SONNENSCHN NATH & ROSENTHAL LLP P.O. BOX 061080 WACKER DRIVE STATION, SEARS TOWER CHICAGO, IL 60606-1080			LEUNG, QUYEN PHAN	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/815,670

**Applicant(s)**

YOSHIDA ET AL.

**Examiner**

Quyen P. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,5,6,8,9,13,14,16,17,21,22 and 24-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5,6,8,9,13,14,16,17,21,22 and 24-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. In response to applicant's amendment filed 11/17/2003, claims 1, 6, 8, 9, 14, 16, 17, 22, 24 have been amended, claims 25-30 added, and claims 2-4, 7, 10-12, 15, 18-20, and 23 canceled. Claims 1, 5-6, 8-9, 13-14, 16-17, 21-22, 24-30 are pending.

***Claim Objections***

2. Claims 6, 8 are objected to because of the following informalities: they are duplicates of claim 5. Appropriate correction is required.

3. Claims 14, 16 are objected to because of the following informalities: they are duplicates of claim 13. Appropriate correction is required.

4. Claims 22, 24 are objected to because of the following informalities: they are duplicates of claim 21. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 5-6, 8-9, 13-14, 16-17, 21-22, 24-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 1 recites the limitation "a stack of group III nitride semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron" in lines 2-3. It is unclear whether or not the semiconductor films should contain nitrogen. The recitation "group

III nitride” suggests that it should, but “semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” suggests otherwise.

8. Claim 1 recites the limitation "said ridge-like strip" in line 9. There is insufficient antecedent basis for this limitation in the claim. Did applicant mean --said ridge-like stripe— instead?

9. Claim 1 recites the limitation "the current non-injection region **of the stacked film**" in lines 15-16. There is insufficient antecedent basis for this limitation in the claim. Previously claimed was a current non-injection region (see line 9) which was formed on both sides of the ridge-like stripe, or in other words on both sides of the upper portion of the stacked film (see lines 5-6). So this makes it unclear, whether or not the current non-injection region is part of the stacked film (see lines 2-3).

10. Claim 1 recites “a film” in the first line of the last paragraph. It is unclear whether this is “film” is part of the stacked film (see cl. 1 paragraph 1) or not, because of the article “a” preceding it. Clarification is requested.

11. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between an active layer (claim 1, line 15) and the stacked film (claim 1, line 2), between a film (claim 1 line 15) and the stacked film (claim 1, line 2).

12. Claim 9 recites the limitation “a stack of group III nitride semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” in lines 2-3. It is unclear whether or not the semiconductor films should contain nitrogen. The recitation “group

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III nitride” suggests that they should, but “each containing at least one kind selected from aluminum, gallium, indium, and boron” suggests that they need not.

13. Claim 9 recites the limitation "said ridge-like strip" in line 9. There is insufficient antecedent basis for this limitation in the claim. Did applicant mean --said ridge-like stripe— instead?

14. Claim 9 recites the limitation "the current non-injection region **of the stacked film**" in lines 15-16. There is insufficient antecedent basis for this limitation in the claim. Previously claimed was a current non-injection region (see line 9) which was formed on both sides of the ridge-like stripe, or in other words on both sides of the upper portion of the stacked film (see lines 5-6). So this makes it unclear, whether or not the current non-injection region is part of the stacked film (see lines 2-3).

15. Claim 9 recites “a film” in the first line of the last paragraph. It is unclear whether this is “film” is part of the stacked film (see cl. 9 paragraph 1) or not, because of the article “a” preceding it. Clarification is requested.

16. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between an active layer (see line 15) and the stacked film (see line 2), between a film (see line 15) and the stacked film (see line 2).

17. Claim 17 recites the limitation “a stack of group III nitride semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” in lines 2-3. It is unclear whether or not the semiconductor films should contain nitrogen. The recitation “group

III nitride” suggests that it should, but “semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” suggests otherwise.

18. Claim 17 recites the limitation "said ridge-like strip" in line 9. There is insufficient antecedent basis for this limitation in the claim. Did applicant mean --said ridge-like stripe— instead?

19. Claim 17 recites the limitation "the current non-injection region **of the stacked film**" in lines 15-16. There is insufficient antecedent basis for this limitation in the claim. Previously claimed was a current non-injection region (see line 9) which was formed on both sides of the ridge-like stripe, or in other words on both sides of the upper portion of the stacked film (see lines 5-6). So this makes it unclear, whether or not the current non-injection region is part of the stacked film (see lines 2-3).

20. Claim 17 recites “a film” in the first line of the last paragraph. It is unclear whether this is “film” is part of the stacked film (see cl. 17 paragraph 1) or not, because of the article “a” preceding it. Clarification is requested.

21. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between an active layer (see line 15) and the stacked film (see line 2), between a film (see line 15) and the stacked film (see line 2).

22. Claim 25 recites the limitation “a stack of group III nitride semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” in lines 2-3. It is unclear whether or not the semiconductor films should contain nitrogen. The recitation “group

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III nitride” suggests that it should, but “semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” suggests otherwise.

23. Claim 25 recites the limitation "said stacked film" in line 4. There is insufficient antecedent basis for this limitation in the claim.

24. Claim 25 recites the limitation "said ridge-like strip" in line 6. There is insufficient antecedent basis for this limitation in the claim. Did applicant mean --said ridge-like stripe— instead?

25. Claim 26 recites the limitation “a stack of group III nitride semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” in lines 2-3. It is unclear whether or not the semiconductor films should contain nitrogen. The recitation “group III nitride” suggests that it should, but “semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” suggests otherwise.

26. Claim 26 recites the limitation "said stacked film" in line 4. There is insufficient antecedent basis for this limitation in the claim.

27. Claim 26 recites the limitation "said ridge-like strip" in line 6. There is insufficient antecedent basis for this limitation in the claim. Did applicant mean --said ridge-like stripe— instead?

28. Claim 26 recites the limitation “between the current non-injection region” in line 10. It is not clear between the current non-injection region and what?

29. Claim 30 recites the limitation “a stack of group III nitride semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” in lines 2-3. It

is unclear whether or not the semiconductor films should contain nitrogen. The recitation “group III nitride” suggests that it should, but “semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron” suggests otherwise.

30. Claim 30 recites the limitation "said stacked film" in line 4. There is insufficient antecedent basis for this limitation in the claim.

31. Claim 30 recites the limitation "said ridge-like strip" in line 6. There is insufficient antecedent basis for this limitation in the claim. Did applicant mean --said ridge-like stripe— instead?

32. Claim 30 recites the limitation "the current non-injection region **of the stacked film**" in lines 9-10. There is insufficient antecedent basis for this limitation in the claim. Previously claimed was a current non-injection region (see line 6) which was formed on both sides of the ridge-like stripe, or in other words on both sides of the upper portion of the stack of films. So this makes it unclear, whether or not the current non-injection region is part of the stacked film.

33. Claim 30 recites “a film” in the first line of the last paragraph. It is unclear whether or not this is “film” is part of the stack of films (see claim 30 paragraph 1), because of the article “a” preceding it. Clarification is requested.

34. Claim 30 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between an active layer (line 9) and the stack of films (line 2), between a film (line 9) and the stack of films (line 2).



*Claim Rejections - 35 USC § 102*

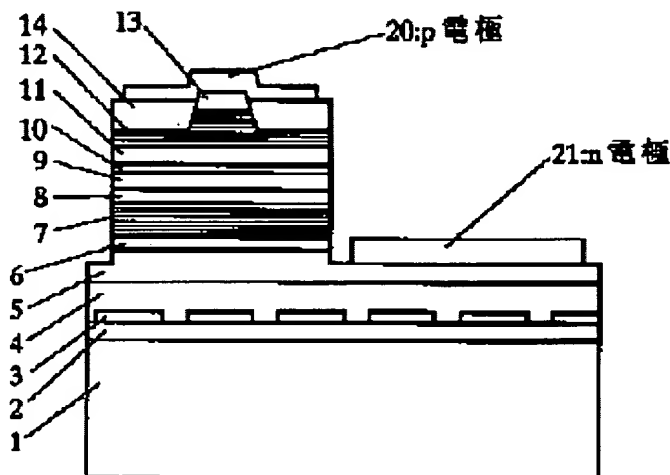
35. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

36. Claims 1, 5-6, 8-9, 13-14, 16-17, 21-22, 24-30 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Nagahama et al (JP 11-204,882). Nagahama et al clearly discloses

【図 1】



the claimed invention.

**ABSTRACT:**

**PROBLEM TO BE SOLVED:** To prevent short-circuit when pits exist on the surface of a clad layer, by forming current blocking layers which are thinner than a clad layer constituted of a first conductivity type nitride semiconductor layer containing Al, and contain second conductivity type nitride semiconductor layers, on both side surfaces of a ridge stripe.

**SOLUTION:** A P-type AlGaN layer is grown, and an undoped GaN layer is grown. By alternately laminating these layers, a P-side clad layer 12 composed of a

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**superlattice layer is grown. A P-side contact layer 13 is grown on the P-side clad layer 12, and a protective film 30 is formed on the surface of the P-side contact layer 13 of the uppermost layer. The P-side contact layer 13 and a part of the P-side clad layer are etched, and a ridge stripe corresponding to the shape of the protective film is formed. Current blocking layers 14 are formed on the side surfaces of the ridge while the P-side contact layer 13 is left below the ridge. An ohmic P-electrode which is continuously bridged on the surfaces of the current blocking layer 14 and the P-side contact layer 13 is formed.**

### *Conclusion*

37. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quyen P. Leung whose telephone number is (571)272-1943. The examiner can normally be reached on 9-5:30, M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (571)272-1941. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Quyen P. Leung  
Primary Examiner  
Art Unit 2828

QPL